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Indian Standard

DIMENSIONS OF FLANGE MOUNTED AC INDUCTION MOTORS

(Second Revision)

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NEW DELHI 110002

Gr 5 *April* 1984

Indian Standard

DIMENSIONS OF FLANGE MOUNTED AC INDUCTION MOTORS

(Second Revision)

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Indian Standard

DIMENSIONS OF FLANGE MOUNTED AC INDUCTION MOTORS

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 20 October 1983, after the draft finalized by the Rotating Machinery Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard was first issued in 1962 and covered the mounting flanges for frame sizes from 90 to 280 specified in IS : 1231-1962. It was revised in 1971 to include mounting flanges for motors equivalent to those having shaft-heights from 56 to 315 mm covered in the IS : 1231-1967*. These dimensions had been adopted from the international publications of the IEC. In the first revision the major modifications carried out related to:

a) shaft runouts, concentricity and perpendicularity of flanges, and

b) standardization of three types of flanges covering a wide range of applications.

In this second revision, B-type flanges of large size frame numbers above 315 mm (*see* 1231-1971* and IS : 8223-1976†) have been included (*see* Tables 2 *and* 3). The provision of tapped holes for B-type flanges has been made in Table 2. C-type flanges have now been recommended up to 132 frame number of IS : 1231-1974*.

0.3 The flanges specified in this standard may also be used on foot-mounted motors in which case requirements of IS : 1231-1974*, IS : 8223-1976† and IS : 996-1979‡, governing the dimensions of foot-mounted motors shall apply.

0.4 D-type flanges are not recommended for motors below frame number 132 of IS : 1231-1974*.

---

*Dimensions of three-phase foot-mounted induction motors.

†Dimensions and output ratings for foot-mounted electrical machines with frame numbers 355 to 1 000.

‡Specification for single-phase small ac and universal electric motors (*second revision*).

0.5 The designation and dimensions of flanges for vertical shaft motors for pumps are covered separately in IS : 2254-1965[*].

0.6 The general requirements of ac induction motors which may have flange mountings are covered separately in the following standards:

IS : 325-1978	Specification for three-phase induction motors (*fourth revision*)
IS : 996-1979	Specification for single-phase small ac and universal electric motors (*second revision*)
IS : 6381-1972	Specification for construction and testing of electrical apparatus with type of protection ' e '
IS : 7538-1975	Specification for three-phase squirrel cage inductor motors for centrifugal pumps for agriculture application
IS : 8289-1976	Specification for electrical equipment with type of protection ' n '

0.7 In the preparation of this standard, assistance has been derived from ICE Publication 72 (1971) 'Dimensions and output ratings for rotating electrical machines — Frame numbers 58 to 400 and flange FF 55 to FF 1 000 and FT 55 to FT 1 080: Part 2 Dimensions of mounting flanges' issued by the International Electrotechnical Commission (IEC).

0.8 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960[†]. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the dimensional requirements for flange mounted motors having enclosures given in IS : 4691-1968[‡] and shaft heights 56 mm to 315 mm specified in IS : 996-1979[§] and IS : 1231-1974[||] with their shaft either in horizontal or vertical position.

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[*] Dimensions of vertical shaft motors for pumps (*revised*).

[†] Rules for rounding off numerical values (*revised*).

[‡] Degrees of protection provided by enclosure for rotating electrical machinery.

[§] Specification for single-phase small ac and universal electric motors (*second revision*).

[||] Dimensions of three phase foot-mounted induction motors (*third revision*).

1.2 This standard also covers dimensions of large flanges of motors with flange numbers between 355 and 1 080 given in IS : 8223-1976* with their shaft either in horizontal or vertical position.

2. LETTER SYMBOLS

2.1 For the purpose of this standard, the following letter symbols shall apply (*see* Fig. 1, 2, 3 and 4).

AC — diameter of motor

AD — distance from the axial centre line of the motor to extreme outside part of terminal box or other most salient object mounted on the side of motor

D — diameter of shaft extension

DA — diameter of second shaft extension

E — length of shaft extension from the shoulder

EA — length of the second shaft extension from the shoulder

e — shaft runout

f — concentricity of mounting spigot

g — perpendicularity of the mounting spigot

F — width of keyway

FA — width of keyway of second shaft

G — distance from the bottom of the keyway to the opposite surface of the shaft extension

GA — distance from top of the key to the opposite surface of the shaft extension

GB — distance from bottom of the keyway to the opposite surface of the second shaft extension

GC — distance from the top of the key to the opposite surface of second shaft extension

GD — thickness of key

GE — depth of keyway at the crown of the shaft

GF — thickness of the key of the second shaft extension

GH — depth of the keyway of the crown of second shaft extension

L — overall length of motor with single shaft extension

LA — thickness of flange

LB — distance from mounting surface of flange to the end of motor

LC — overall length of motor when there is a second shaft extension

---

*Dimensions and output ratings for foot-mounted electrical machines with frame numbers 355 to 1 000.

LD — gap for fixing holes in the flange

M — pitch circle diameter of the fixing holes

N1 — diameter of the mounting spigot

N2 — diameter of the mounting rabbet

NOTE — a) Spigot portion refers to the male part of the flange fitting.
b) Rabbet portion refers to the female part of the flange fitting.

P — outside diameter of the flange or in the case of a non-circular outline, the maximum diametral dimension

R — distance from mounting surface of flange to the shoulder on shaft

S — diameter of clearances (fixing) holes in mounting flange or nominal diameter of thread

T — depth of spigot

NOTE — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols in Fig. 1 to 4 refer to dimensions which are specified in this standard.

3. DESIGNATION OF FLANGE MOUNTED MOTORS

3.1 Three types of mounting flanges are recognised in Table 1 which are designated as type B, C and D type.

3.2 The flange numbers in Tables 2 to 5 correspond to the pitch circle diameter of the fixing holes in millimetres. The letter *F* is added to indicate that the motor is flange-mounted. Example: F115B.

3.3 Motors manufactured in accordance with Tables 2 to 5 should carry a mark on the rating plate which includes the frame number and the flange number taken from these tables. Example: 132-F400D.

4. STANDARD FRAME SIZES, DIMENSIONS AND OUTPUT RATINGS

4.1 The fixing dimensions for the different flange numbers covered by this standard shall be as follows:

a) Table 2 and Table 3 for B-type flanges (*see* Fig. 1 and 4).

b) Table 4 for C-type flanges (*see* Fig. 2 and 4).

c) Table 5 for D-type flanges (*see* Fig. 3 and 4).

4.2 Shaft extension dimensions and their association with rated outputs for different class of insulations shall be in accordance with IS : 996-1979* and IS : 1231-1974†.

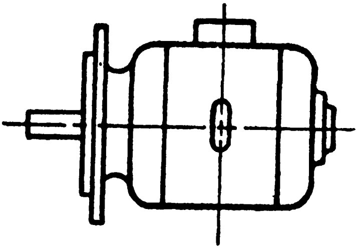
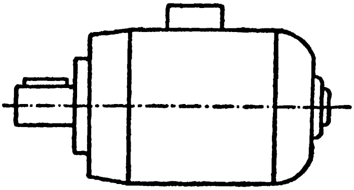
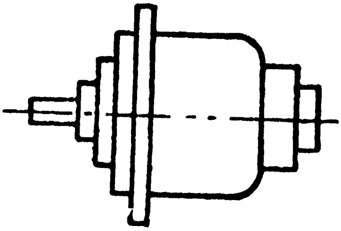
---

*Specification for single-phase small ac and universal electric motors (*second revision*).

†Dimensions of three-phase foot-mounted induction motors (*third revision*).

TABLE 1 DESIGNATION OF TYPES OF FLANGES

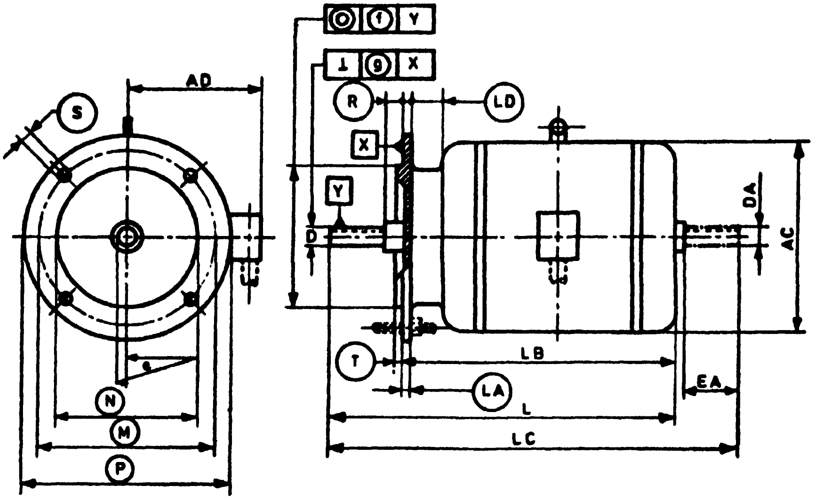
(*Clause* 3.1)

Sl No.	Description of Flange	Symbol	Illustration
(1)	(2)	(3)	(4)
i)	Flange mounted motor with mounting flange near drive-end bearing	B	
ii)	Face mounted motor with mounting face on drive-end and shield	C	
iii)	Flange mounted motor with mounting flange near drive-end of frame	D	

NOTE 1 — All motors shall have free shaft extension.

NOTE 2 — The illustrations given above show the motors having their shafts in horizontal position. However, the same flange designation shall apply to motors having their shaft in vertical position.

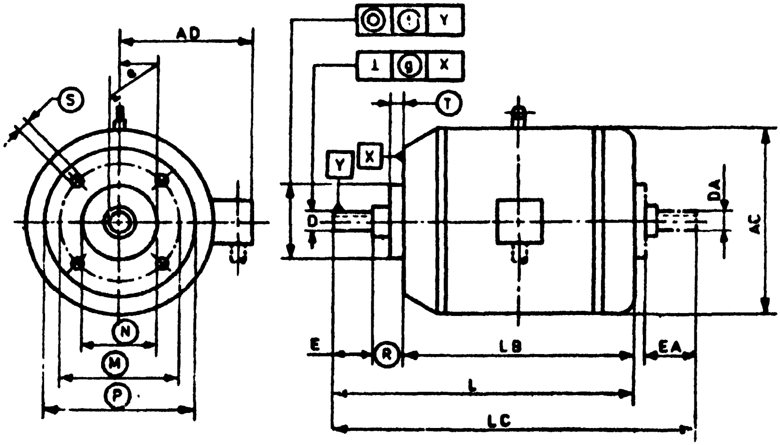
4.3 The accuracies of shaft extension runout, concentricity of mounting spigot and perpendicularity of mounting face to shaft shall be in accordance with 7. The methods of determination of these accuracies shall as specified in 8.



Note 1 — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to dimensions which are specified in this standard.

Note 2 — The shoulder of the shaft should be in the same plane as the face of the flange, that is, dimension *R* would be zero with normal tolerances.

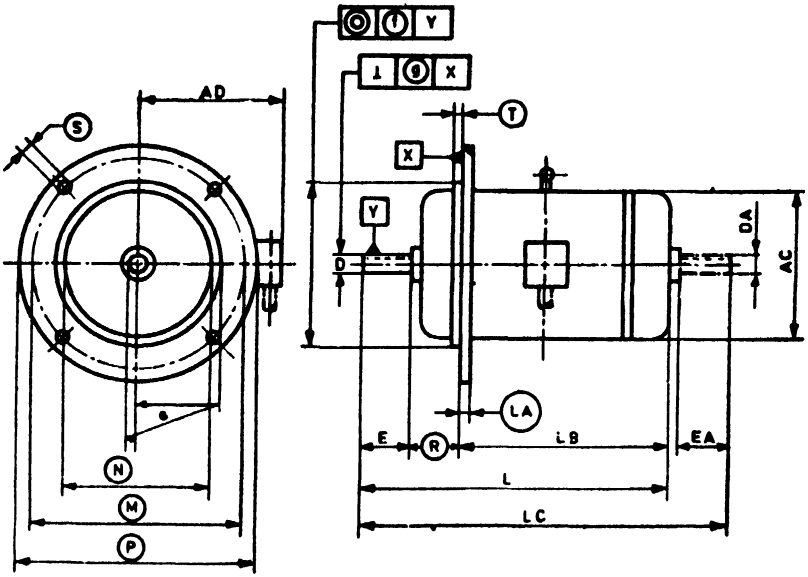
FIG. 1 MOTORS WITH B-TYPE FLANGE



Note 1 — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to the dimensions which are specified in this standard.

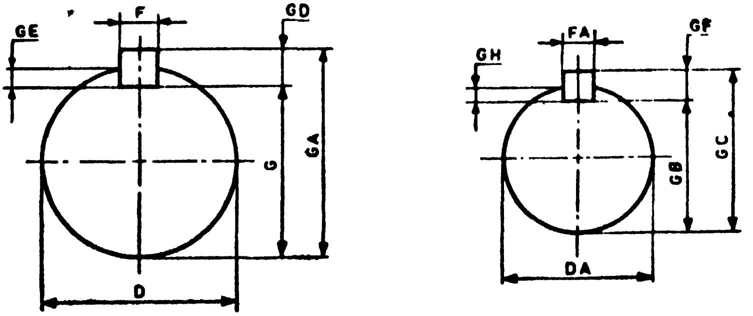
Note 2 — The shoulder of the shaft should be in the same plane as the face of the flange, that is, dimensions *R* would be zero with normal tolerances.

FIG. 2 MOTORS WITH C-TYPE FLANGE



NOTE — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to dimensions which are specified in this standard.

FIG. 3 MOTORS WITH D-TYPE FLANGE



4A Shaft Extension

4B Second Shaft (if Applicable)

FIG. 4 SHAFT EXTENSION DETAILS

5. POSITION OF TERMINAL BOX

5.1 When flange mounted motors also have feet, the location of the terminal box shall be as specified in IS : 996-1979* and IS : 1231-1974†.

5.2 The terminal box on flange mounted motors without feet shall be on the right hand side, when viewed from shaft, with fixing holes position at 45° (22·5° for 8 holes) with respect to vertical plans.

5.2.1 Unless otherwise specified, tolerance on the angle (*see* Fig. 5) 45° for 4 holes, 22·5° for 8 holes and 15° for 12 hole flange shall be 0·5°.

6. POSITION OF FIXING HOLES ON FLANGE IN RELATION TO EYE BOLT OR FEET

6.1 When, flange mounted motors also have feet the position of the holes in a four-hole flange should have an angle of 45° with respect to the plane which passes through the shaft and is perpendicular to the mounting plane of the feet (*see* Fig. 5). For the eight and twelve hole flange, the corresponding angle should be 22·5° and 15°, respectively.

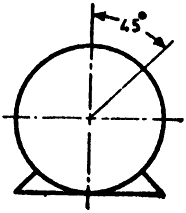


FIG. 5 POSITION OF HOLES IN FOUR-HOLE FLANGE

7. ACCURACIES OF SHAFT EXTENSION RUNOUT (*e*), CONCENTRICITY OF SPIGOT (*f*) AND PERPENDICULARITY OF MOUNTING FACE TO SHAFT (*g*)

7.0 Two classes of accuracies are specified namely, 'Normal' and 'Precision'. Unless otherwise specified, only normal accuracies shall be applied.

7.1 Shaft Extension Runout — The tolerance on shaft extension runout shall be as given in Table 6.

7.2 Concentricity of Spigot Diameter and Perpendicularity of Mounting Face of Flange to Shaft — Concentricity of mounting rabbet (spigot) diameter and tolerances of perpendicularity of supporting face of flange in relation to the shaft of the motor shall be as given in Table 7.

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*Specification for single-phase small ac and universal electric motors (*second revision*).

†Dimensions of three-phase foot-mounted induction motors (*third revision*).

TABLE 2 FRAME NUMBER AND DIMENSION OF MOTORS WITH B-TYPE FLANGE

(*Clauses* 3.2, 3.3, 4.1; *Figs.* 1 *and* 4)

FLANGE NUMBER	FRAME NUMBER*		*M*		*N*				*P*	*R*	NUMBER OF HOLES	*S*				*T* *Max*	*LA*	*LD* *Min*
	Degree of Protection IP 44 or Superior Method of Cooling IC 41	Degree of Protection IP 21, IP 22 and IP 23 and Method of Cooling IC 01	Nominal	Tolerance	Nominal		Tolerance					Nominal	Free Holes Tolerence		Tapped Holes Thread			
(1)	(2)	(3)	(4) mm	(5) mm	(6) mm	(7)	(8) µm	(9) µm	(10) mm	(11) mm	(12)	(13) mm	(14) µm	15 µm	(16)	(17) mm	(18) mm	(19) mm
F 115 B	56 and 63	56 and 63	115	± 0·3	95	j6	+ 13	— 9	140	0	4	10	+ 360	0	M8	3	9	16
F 130 B	71	71	130	± 0·3	110	j6	+ 13	— 9	160	0	4	10	+ 360	0	M8	3·5	9	16
F 165 B	80 and 90	80 and 90	165	± 0·3	130	j6	+ 11	— 11	200	0	4	12	+ 430	0	M10	3·5	10	20
F 215 B	100 and 112	100 and 112	215	± 0·3	180	j6	+ 14	— 11	250	0	4	15	+ 430	0	M12	4	11	24
F 265 B	132	132	265	± 0·3	230	j6	+ 16	— 13	300	0	4	15	+ 430	0	M12	4	12	24
F 300 B	160 and 180	—	300	± 0·5	250	j6	+ 16	— 13	350	0	4	19	+ 520	0	M16	5	13	32
F 350 B	200	160 and 180	350	± 0·5	300	j6	+ 16	— 16	400	0	4	19	+ 520	0	M16	5	15	32
F 400 B	225	200	400	± 0·5	350	j6	+ 18	— 18	450	0	8	19	+ 520	0	M16	5	16	32
F 500 B	250 and 280	225	500	± 0·5	450	j6	+ 20	— 20	550	0	8	19	+ 520	0	M20	5	18	32
F 600 B	315	250 and 280	600	± 1·0	550	js6	+ 22	— 22	660	0	8	24	+ 520	0	M24	6	22	40
F 740 B	355	315	740	± 1·0	680	js6	+ 25	— 25	800	0	8	24	+ 520	0	M24	6	25	40
F 940 B	400 and 450	400	940	± 1·0	880	js6	+ 28	— 28	1 000	0	8	28	+ 520	0	M24	6	25	40

NOTE — The dimension *LA* refers to the flange thickness at the place where the stud is fixed. In other places, the flange thickness can be selected depending upon the material used. This dimension is given for guidance.

*Frame number same as in IS : 996-1979 ' Specification for single-phase small ac and universal electric motors (*second revision*) ' and IS : 1231-1974 ' Dimensions of three-phase foot-mounted induction motors (*third revision*)'.

TABLE 3 DIMENSIONS OF B-TYPE FLANGE FOR LARGE FRAME NUMBER MOTORS*

(*Clause* 3.2, 3.3, *and* 4.1 *and* Fig. 1 *and* 4)

FLANGE NUMBER	DIMENSIONS						
	M	*N*	*P*	*S*		*T*	*LA*
				Drilled hole size	Number		
(1)	(2) mm	(3) mm	(4) mm	(5) mm	(6)	(7) mm	(8) mm
F 1080 B	1 080	*See* Note 1	1 150	28	8	*See* Note 1	*See* Note 2
F 1180 B	1 180		1 250	28	8		
F 1250 B	1 250		1 320	28	8		
F 1280 B	1 280		1 360	28	8		
F 1320 B	1 320		1 400	28	8		
F 1400 B	1 400		1 480	28	8		
F 1500 B	1 500		1 600	35	8		
F 1550 B	1 550		1 650	35	8		
F 1600 B	1 600		1 700	35	8		
F 1700 B	1 700		1 800	35	12		
F 1850 B	1 850		1 950	35	12		
F 2000 B	2 000		2 120	38	12		
F 2180 B	2 180		2 300	38	12		

NOTE 1 — The dimensions *N* and *T* in Table 3 are not specified because these are not normally required for large machines. Special requirements if any, may be agreed between the manufacturer and the user.

NOTE 2 — The thickness of flange *LA* in Table 3, may be selected suitably depending on the type of construction.

*The details in this table are applicable to flange mounted motors of V_1 design with shaft downward.

TABLE 4 FRAME NUMBER AND DIMENSIONS OF MOTORS WITH SMALLER C-TYPE FLANGES

(*Clauses* 3.2, 3.3, *and* 4.1, *and* Figs. 2 *and* 4)

FLANGE NUMBER	FRAME* NUMBER	*M*		*N*		*P*	*S*		DEPTH OF TAPPED HOLE	*T* *Max*
		Size	Tolerance	Size	Tole-rance		Threaded size	No.		
(1)	(2)	(3) mm	(4) mm	(5) mm	(6)	(7) mm	(8)	(9)	(10) mm	(11) mm
F 65 C	56	65	± 0·3	50	j6	80	M5	4	6	2·5
F 75 C	63	75	± 0·3	60	j6	90	M5	4	6	2·5
F 85 C	71	85	± 0·3	70	j6	105	M6	4	8	2·5
F 100 C	80	100	± 0·3	80	j6	120	M6	4	8	3·0
F 115 C	90	115	± 0·3	95	j6	140	M8	4	10	3·0
F 130 C	100	130	± 0·3	110	j6	160	M8	4	10	3·5
F 130 C	112	130	± 0·3	110	j6	160	M8	4	10	3·5
F 165 C	132	165	± 0·3	200	j6	160	M12	4	12	3·5

*Frame numbers same as in IS : 996-1979 'Specification for single-phase small ac and universal electric motors (*second revision*)' and IS : 1231-1974 'Dimensions of three-phase foot-mounted induction motors (*third revision*)'.

TABLE 5 FRAME NUMBER AND DIMENSIONS OF MOTORS WITH D-TYPE FLANGE

(*Clauses* 3.2, 3.3, 4.2 *and* Figs. 3 *and* 4)

Flange Number	Frame* Number	*M*		*N*		*P*	*R*	*S* Dia		*T* *Max*	*LA*
		Size	Tolerance	Size	Tolerance			Drilled Size	No.		
(1)	(2)	(3) mm	(4) mm	(5) mm	(6)	(7) mm	(8) mm	(9) mm	(10)	(11) mm	(12) mm
F 400 D	132	400	± 0·5	350	j6	450	71	19	8	5	20
F 400 D	160	400	± 0·5	350	j6	450	90	19	8	5	20
F 500 D	180	500	± 0·5	450	j6	550	103	19	8	5	20
F 500 D	200	500	± 0·5	450	j6	550	115	19	8	5	20
F 600 D	225	600	± 1·0	550	js6	660	127	24	8	6	24
F 600 D	250	600	± 1·0	550	js6	660	146	24	8	6	24
F 740 D	280	740	± 1·0	680	js6	800	168	24	8	6	24
F 740 D	315	740	± 1·0	680	js6	800	194	24	8	6	24

*Frame numbers same as in IS : 1231-1974 Dimensions of three-phase foot-mounted induction motors (*third revision*).

TABLE 6 ACCURACIES OF SHAFT EXTENSION RUNOUT (*e*)

(*Clauses* 4.3, 7.1, 8.1; *and* Fig. 7 *and* Fig 9)

DIAMETER OF SHAFT EXTENSION	SHAFT EXTENSION RUNOUT (*e*)	
	Normal Class	Precision Class
(1) mm	(2) µm	(3) µm
Up to and including 10	30	15
Over 10 up to and including 18	35	18
Over 18 up to and including 30	40	21
Over 30 up to and including 50	50	25
Over 50 up to and including 80	60	30
Over 80 up to and including 120	70	35
Over 120 up to and including 140	80	40
Over 140 up to and including 160	90	50

NOTE — For downward shaft mounting machines and having larger shaft diametres the values of accuracy of shaft extension runout are recommended in Fig. 9.

TABLE 7 ACCURACIES OF CONCENTRICITY (*f*) AND PERPENDICULARITY (*g*)

(*Clauses* 4.3, 7.2, 8.2, 8.3 *and* Fig. 7, 8 *and* 9)

FLANGE NUMBER	SPIGOT DIA N_1	MAXIMUM PERMISSIBLE CHANGE IN INDICATOR READING CONCENTRICITY (*f*)		OUTSIDE DIA, *P*	PERPENDICULARITY (*g*)	
		Normal Class	Precision Class		Normal Class	Precision Class
(1)	(2) mm	(3) µm	(4) µm	(5) mm	(6) mm	(7) µm
F 65	50	80	40	80	80	40
F 75	60	80	40	90	80	40
F 85	70	80	40	105	80	40
F 100	80	80	40	120	80	40
F 115	95	80	40	140	80	40
F 130	110	100	50	160	100	50
F 165	130	100	50	200	100	50
F 215	180	100	50	250	100	50
F 265	230	100	50	300	100	50
F 300	250	125	63	350	125	63
F 350	300	125	63	400	125	63
F 400	350	125	63	450	125	63
F 500	450	125	63	550	125	63
F 600	550	160	80	660	160	80
F 740	680	160	80	800	160	80
F 940	880	200	100	1 000	200	100
F 1080	1 000	200	100	1 150	200	100

NOTE — The values of concentricity (*f*) and perpendicularity (*g*) are also illustrated in Fig. 9. In the case of large flanges these accuracies may be calculated by extrapolation from Fig. 9.

8. METHODS OF MEASUREMENT

8.1 Shaft Extension Runout — To measure the shaft extension runout with rotation of shaft, apply the point of the indicator on the shaft midway along its length as shown in Fig. 6. Read the maximum and minimum values on the indicator through one slow revolution of the shaft, the difference between the readings (*e*) shall not exceed the permissible tolerances given in Table 6.

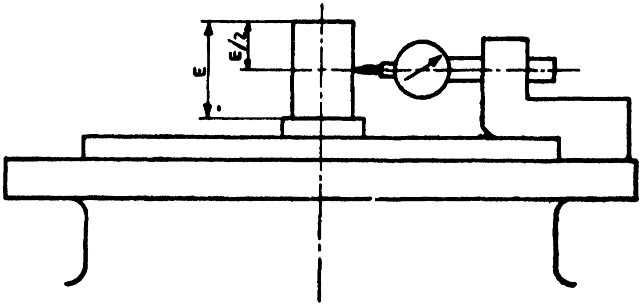


FIG. 6 MEASUREMENT OF SHAFT EXTENSION RUN-OUT (*e*)

8.2 Concentricity of Mounting Rabbet (Spigot) and Shaft — To measure the concentricity of spigot and shaft, fix the indicator rigidly on the shaft extension by means of a device similar to that in Fig. 7 at a distance of about 10 mm from the mounting face of the flange. Read the maximum and minimum values through one slow revolution of the shaft. The difference between the extreme readings of the test indicator shall not exceed the values for concentricity (*f*) given in Table 7.

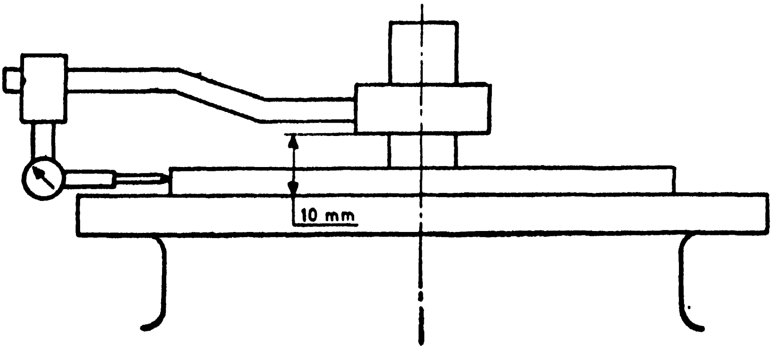


FIG. 7 MEASUREMENT OF CONCENTRICITY OF MOUNTING RABBET (SPIGOT) AND SHAFT (*f*)

8.2.1 In the case of large machines with tilting pad type or bush type journal bearings the method of measuring spigot runout and face runout shall be agreed between the manufacturer and the user.

8.2.2 It is recommended that test in **8.2** be carried out on the machines set up with shaft vertical so as to make the measurements free from effects of gravity.

8.3 Perpendicularity of Mounting Face of Flange to Shaft — Fix the indicators rigidly on the shaft extension by means of a device similar to that shown in Fig. 8 at a distance of about 10 mm from the mounting face of the flange. Read the maximum and minimum values through one slow revolution of the shaft. The difference between the extreme readings of the perpendicularity indicator shall not exceed the values (*g*) given in Table 7.

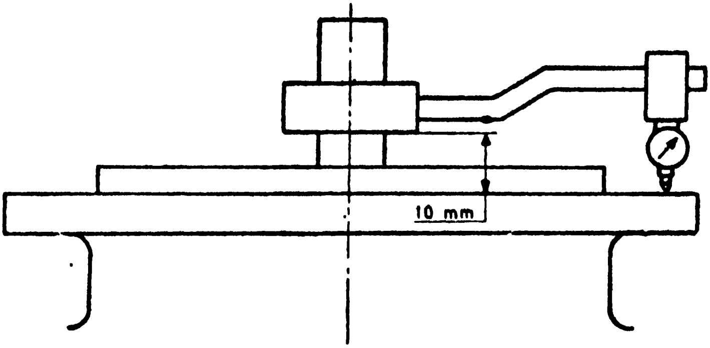
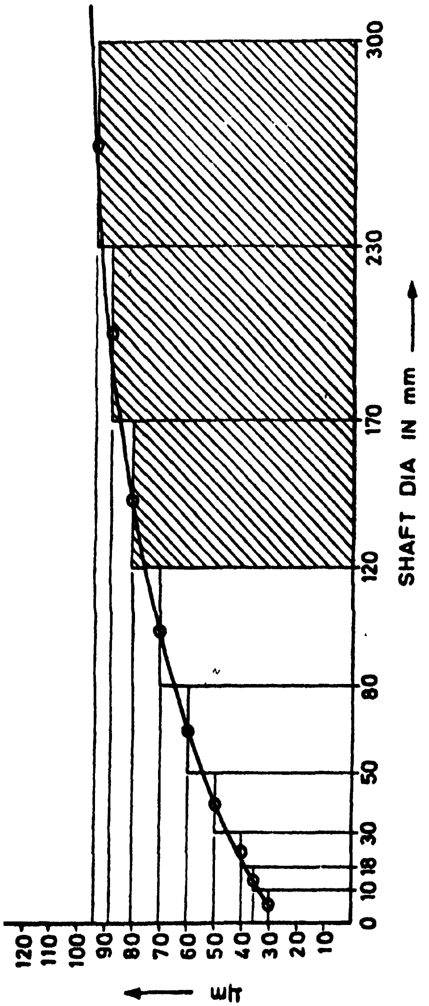
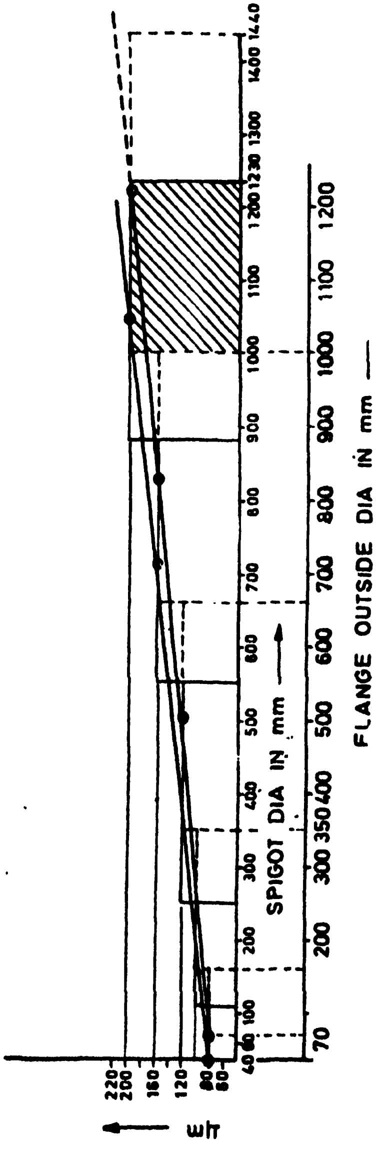


FIG. 8 MEASUREMENT OF PERPENDICULARITY OF MOUNTING FACE OF FLANGE AND SHAFT (*g*)

8.3.1 It is recommended that the test should be carried out on motor set with shaft vertical so as to eliminate axial clearance in bearing.



9A Shaft Extension Run-Out (Normal Class)



9B Concentricity of Spigot and Perpendicularity of Mounting Face of Flange to Shaft (Normal Class)

FIG. 9 ACCURACIES OF SHAFT AND MOUNTING FACE

(*Continued from page* 2)

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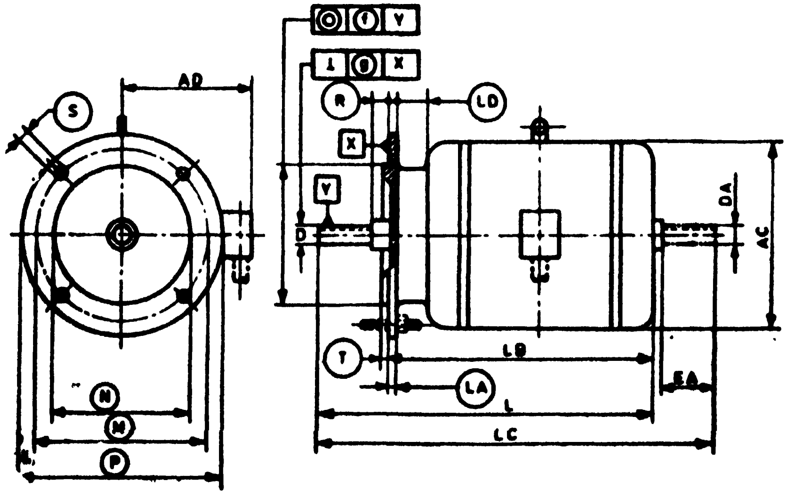
Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 1 JANUARY 1990
TO
IS : 2223 - 1983 DIMENSIONS OF FLANGE MOUNTED AC INDUCTION MOTORS

(Second Revision)

(Explanatory Note — The symbol of eccentricity '*e*' has been deleted as the same is already incorporated through the graphical engineering drawing symbols).

(*Page* 8, *Fig*. 1) — Substitute the following for the existing figure:

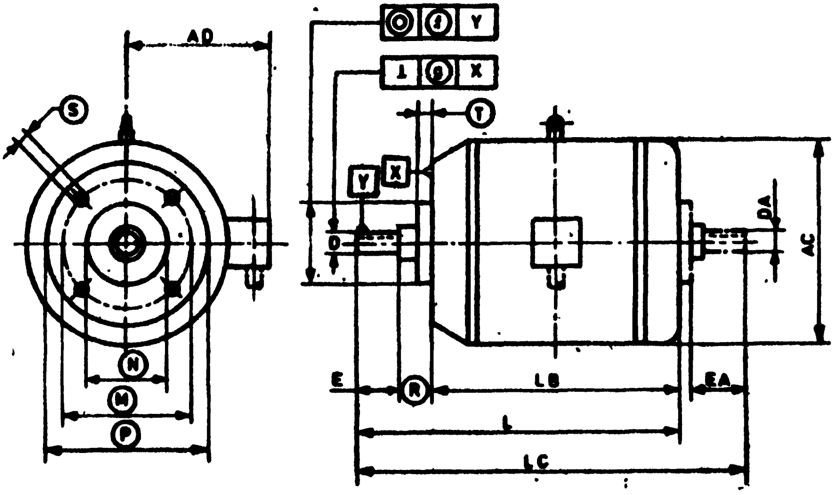


NOTE 1 — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to dimensions which are specified in this standard.

NOTE 2 — The shoulder of the shaft should be in the same plane as the face of the flange, that is, dimension *R* would be zero with normal tolerances.

FIG. 1 MOTORS WITH B-TYPE FLANGE

(*Page* 8, *Fig*. 2) — Substitute the following for the existing figure:

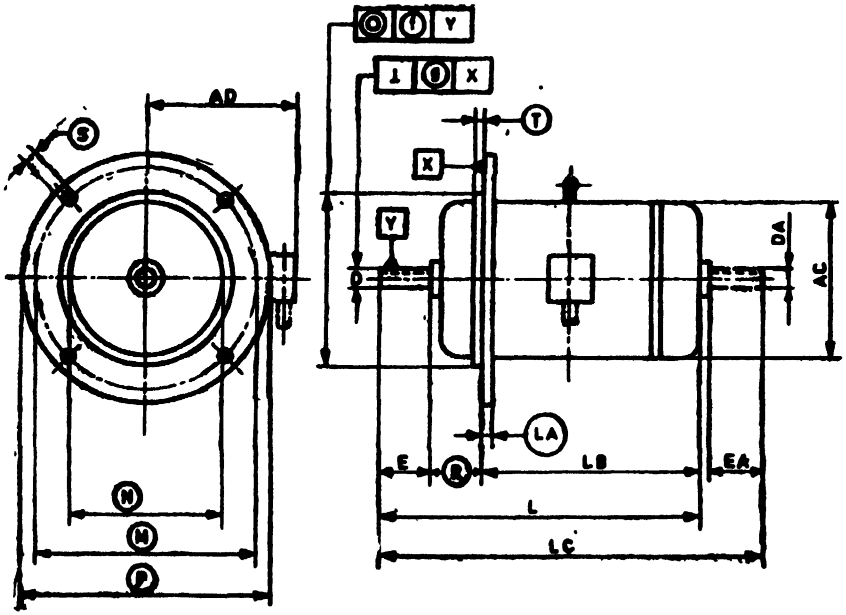


NOTE 1 — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to the dimensions which are specified in this standard.

NOTE 2 — The shoulder of the shaft should be in the same plane as the face of the flange, that is, dimension *R* would be zero with normal tolerances.

FIG. 2 MOTORS WITH C-TYPE FLANGE

(*Page* 9, *Fig.* 3) — Substitute the following for the existing figure:



NOTE — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to dimensions which are specified in this standard.

FIG. 3 MOTORS WITH D-TYPE FLANGE

(ETDC 15)

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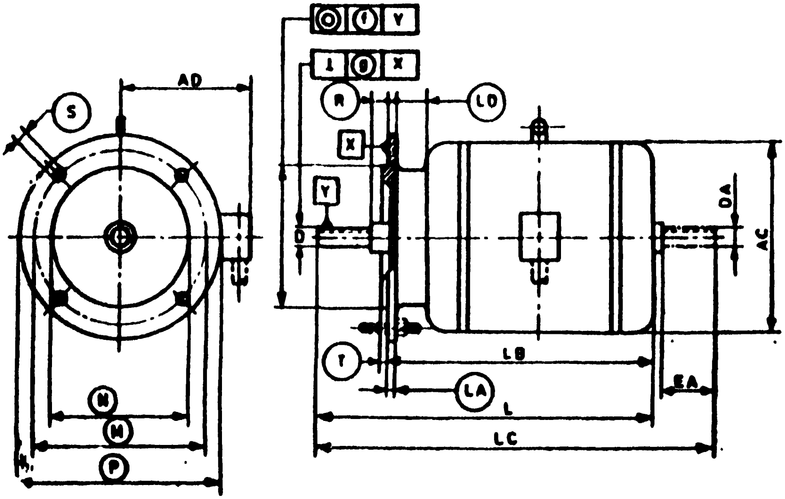
(Second Revision)

(Explanatory Note — The symbol of eccentricity '*e*' has been deleted as the same is already incorporated through the graphical engineering drawing symbols).

(*Page* 8, *Fig.* 1) — Substitute the following for the existing figure:

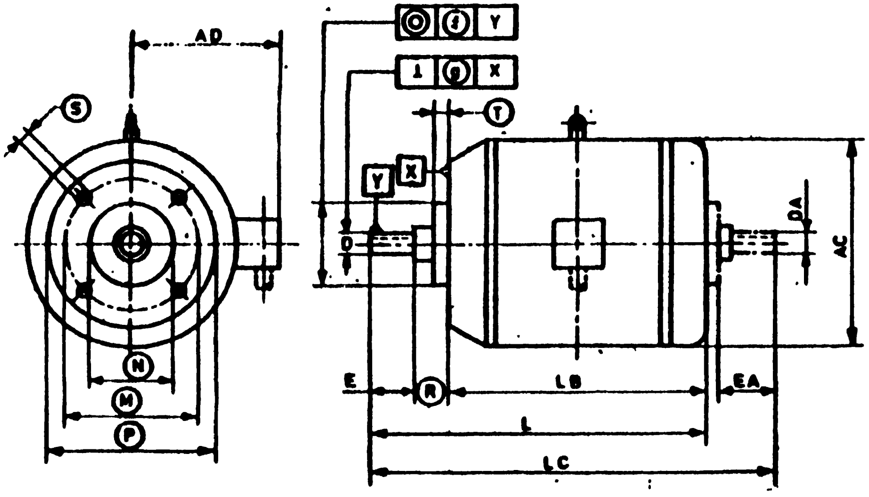


NOTE 1 — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to dimensions which are specified in this standard.

NOTE 2 — The shoulder of the shaft should be in the same plane as the face of the flange, that is, dimension *R* would be zero with normal tolerances.

FIG. 1 MOTORS WITH B-TYPE FLANGE

(*Page* 8, *Fig.* 2) — Substitute the following for the existing figure:

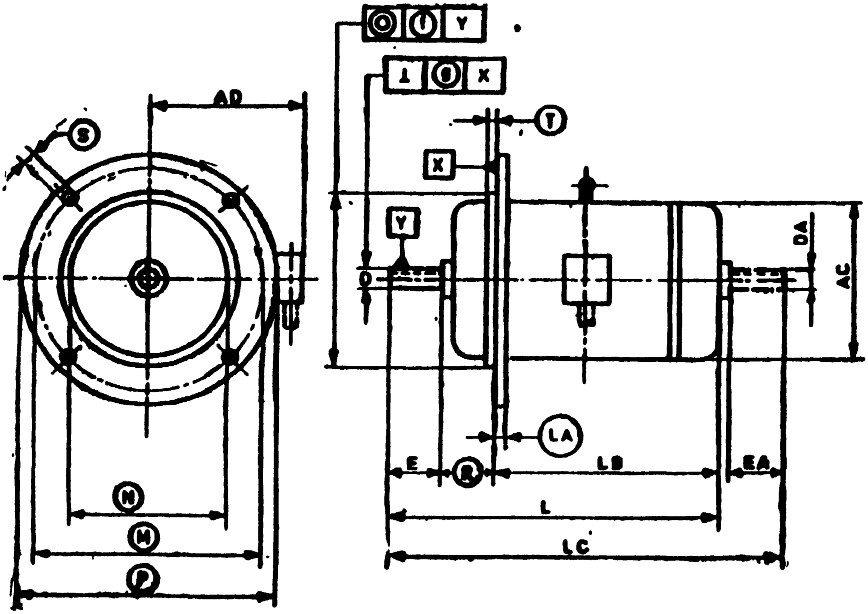


NOTE 1 — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to the dimensions which are specified in this standard.

NOTE 2 — The shoulder of the shaft should be in the same plane as the face of the flange, that is, dimension *R* would be zero with normal tolerances.

FIG. 2 MOTORS WITH C-TYPE FLANGE

(*Page* 9, *Fig.* 3) — Substitute the following for the existing figure:



NOTE — Symbols are standardized to facilitate reference when ordering motors to this standard. The ringed symbols refer to dimensions which are specified in this standard.

FIG. 3 MOTORS WITH D-TYPE FLANGE

(ETDC 15)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 JANUARY 1993
TO
IS 2223 : 1983 DIMENSIONS OF FLANGE MOUNTED AC INDUCTION MOTORS

(*Second Revision*)

(*Page* 13, *Table* 3) — Substitute the following for the existing table:

TABLE 3 DIMENSIONS OF B-TYPE FLANGE FOR LARGE FRAME NUMBER MOTORS*

(*Clauses* 3.2, 3.3, *and* 4.1 *and* Fig. 1 *and* 4)

FLANGE NUMBER	DIMENSIONS						
	M	*N*	*P*	*S*		*T*	*LA*
				Drilled hole size	No.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	mm	mm	mm	mm		mm	mm
F 1 080 B	1 080	*see* Note 1	1 150	28	8	*see* Note 1	*see* Note 2
F 1 180 B	1 180		1 250	28	8 or 16		
F 1 250 B †	1 250		1 320	28	8		
F 1 320 B	1 320		1 400	28	8 or 16		
F 1 400 B †	1 400		1 480	28	8		
F 1 500 B	1 500		1 600	28	12 or 24		
F 1 700 B	1 700		1 800	28	12 or 24		
F 1 900 B	1 900		2 000	35	12 or 24		
F 2 000 B †	2 000		2 120	38	12		
F 2 120 B	2 120		2 240	35	12 or 24		
F 2 360 B	2 360		2 500	35	16 or 32		

NOTE 1 — The dimensions *N* and *T* in Table 3 are not specified because these are not normally required for large machines. Special requirements, if any, may be agreed between the manufacturer and the user.

NOTE 2 — The thickness of flange *LA* in Table 3, may be selected suitably depending on the type of construction.

*The details in this table are applicable to flange mounted motors of VI design with shaft downward.

†These flange numbers have been retained for the purpose of continuity and are not preferred.

(ETDC 15)

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